

REG. NO. 1001
ART 34 AWDIT

CLAIMS

1. An assembly of devices for production of green tyres, consisting of a belt building drum, a tread building drum, a carcass building drum and a tyre building drum, and further including devices for transferring particular semi-products from one device to another, a device for positioning and supporting the bead cores and the carcass assembly, a stitching device and material servisers, which are associated with the respective drums,

characterized in that

it is arranged on two parallel transfer tracks (20 and 50) and it comprises:

on a first transfer track (20), a movably disposed carcass building drum (30), a movably disposed tyre building drum (130), which is oriented opposite to the building drum (30), a device (150) for supporting and adjusting the bead cores and the carcass assembly being disposed between the building drum (30) and the tyre building drum (130),

on a second transfer track (50), a movably disposed belt building drum (60), a tread building drum (70), between the movably disposed building drum (60) and the winding drum (70) being disposed a first transfer ring (80) to transfer the belt from the building drum (60) onto the tread building drum (70),

an auxiliary track (90), arranged perpendicularly to the first and second transfer track (20, 50) in a horizontal plane above the first and second transfer track (20, 50) at the completing place (140), which is disposed on the first transfer track (20), wherein a second transfer ring (100) is disposed below the auxiliary track (90) to deliver the belt-tread assembly to the completing place (140), as well to remove the complete green tyre,

a device (170) for spiralling a narrow strip together with a serviser for the narrow strip to be spiralled, which is associated with the winding drum (70),

a serviser (180) for supplying materials for preparation of the carcass assembly to the carcass building drum (30),

servisers (190) for supplying breaker plies to the belt building drum (60),

a serviser (200) for supplying tread to the winding drum (70) for production of the belt-tread assembly,

a stitching device (160) for forming the tyre edges, which is disposed close to the transfer track (20) at the completing place (140).

2. An assembly of devices for production of green tyres according to claim 1, characterized in that

the belt building drum (60) is carried by a shaft of the machine house (40), which is movably disposed on the second transfer track (50), and the winding drum (70) for production of the belt-tread assembly is carried by a shaft of a second machine house (42), which is also movably disposed on the second transfer track (50), and the drums are arranged on one horizontal axis and oriented one against each other.

3. An assembly of devices for production of green tyres according to claim 1, characterized in that

the belt building drum (60) and the winding drum (70) for production of the belt-tread assembly are carried by two independent, coaxially arranged shafts on one axis with the machine house (40), which is movably disposed on the second transfer track (50), being arranged so that the building drum (60) is disposed closer to the machine house (40) and the building drum (70) is arranged further apart from the machine house (40), and a first transfer ring (80) is movably disposed therebetween.

4. An assembly of devices for production of green tyres according to any of the claims 1 to 3,

characterized in that

the device (150) for supporting and adjusting the bead cores and the carcass assembly, is movably disposed on the first transfer track (20) between the building drum (30) and the tyre building drum (130).

5. An assembly of devices for production of green tyres according to any of the claims 1 to 3,

characterized in that the device (150) for supporting and adjusting the bead cores and holding the carcass assembly is disposed on the first transfer track (20) at the completing place (140).

6. An assembly of devices for production of green tyres according to any of the claims 1 to 5,

characterized in that a second transfer ring (100) for delivering the belt-tread assembly to the completing place (140), as well as for removing the complete green tyre, is movably suspended on the auxiliary track (90) and moving along the auxiliary track (90) in a vertical plane, perpendicular to the transfer tracks (20 and 50) and intersecting the transfer track (20) at the completing place (140).

7. An assembly of devices for production of green tyres according to any of the claims 1 to 5,

characterized in that the auxiliary track (90) with the second transfer ring (100) is provided in the form of a transfer device (91), equipped with 2 to 4 transfer rings (101 to 104), which are regularly displaced and arranged rotationally around a rotation axis parallel to the first and second transfer track (20, 50), wherein the transfer rings (101 to 104) are rotationally disposed in a vertical plane, perpendicular to the rotation axis, as well as to both the first and the second transfer track (20, 50), wherein if one of the rings (101 to 104) extends to the completing place (140) and is disposed on one axis with the tyre building drum (130), the opposite ring (101 to 104) is disposed on the axis of the building drums (60 and 70).

8. An assembly of devices for production of green tyres according to any of the claims 1, 2, 3, 4 or 6,

characterized in that a stitching device (160) is disposed at the completing place from the outside of the first transfer track (20).

9. An assembly of devices for production of green tyres according to any of the claims 1 to 7,
characterized in that
the stitching device (160) is disposed at the completing place (140) from the inner side of the first transfer track (20) and below the transfer device (91).

10. A method for production of green tyres,
characterized in that
it includes the following steps:

- belt preparation on the belt building drum (60), which is disposed on the second transfer track (50), by winding up the first and subsequently the second breaker ply delivered from breaker ply servisers;
- belt transfer from the building drum (60) onto the winding drum (70) by a movement of the first transfer ring (80) on the second transfer track (50);
- winding up the tread (7) onto the belt, wherein the tread is supplied from the tread serviser (200) and a belt-tread assembly results;
- shifting the belt-tread assembly into the area of the auxiliary track (90);
- clamping and transfer of the belt-tread assembly to the completing place (140) by the second transfer ring (100);
- preparation of a carcass assembly, consisting of the tyre sidewalls, the inner rubber and one or two carcass plies, on a building drum (30), disposed on the first transfer track (20), from carcass materials supplied by a combined serviser (180) of the carcass assembly;
- transfer of the carcass assembly from the building drum (30) into the device (150) for supporting and adjusting the bead cores and carcass assembly and adjusting the bead cores into the correct position;
- transfer of the carcass assembly with adjusted bead cores by the device (150) for adjusting and supporting the bead cores and carcass assembly onto the tyre building drum (130) by a movement on the first transfer track to the completing place (140);
- completion of the green tyre on the tyre building drum (130), including

rotating the tyre building drum (130), inflating the carcass assembly, wrapping the bead cores, bringing them closer to each other and subsequent creating the tyre sidewalls and attaching the belt-tread assembly;

- stitching the belt-tread assembly by the stitching device (160);
- clamping and transfer of the completed green tyre by the second transfer ring (100) to a place, where it can be removed.

11. A method for production of green tyres, characterized in that it includes the following steps:

- belt preparation on the belt building drum (60), which is disposed on the second transfer track (50), by winding up the first and subsequently the second breaker ply delivered from breaker ply servisers (190);
- belt transfer from the building drum (60) onto the winding drum (70) by a movement of the first transfer ring (80) on the second transfer track (50);
- winding up the tread (7) onto the belt, where the tread is supplied from the tread serviser (200) and a belt-tread assembly results;
- shifting the belt-tread assembly into the area of one of the transfer rings (101 to 104) of the transfer device (91), which is currently present in the area of the second transfer track on the axis of the building drums (60, 70);
- preparation of a carcass assembly, consisting of the tyre sidewalls, the inner rubber and one or two carcass plies, on the building drum (30), disposed on the first transfer track (20), from carcass materials supplied by a combined serviser (180) of the carcass assembly;
- transfer of the carcass assembly by the carcass building drum (30) into the device (150) for adjusting and supporting the bead cores and carcass assembly and adjusting the bead cores into the correct position;
- taking over the carcass assembly with adjusted bead cores by the tyre building drum (130) from the device (150) at the completing place (140) and transfer of the tyre building drum (130) to the starting position;
- transfer of the belt-tread assembly to the completing place (140) by one of the transfer rings (101 to 104) of the transfer device (91);

- transfer of the carcass assembly with adjusted bead cores to the completing place (140);

- completion of the green tyre on the tyre building drum (130), including rotating the tyre building drum (130), inflating the carcass assembly, wrapping the bead cores, bringing them closer to each other and subsequent creating the tyre sidewalls and attaching the belt-tread assembly;

- stitching the belt-tread assembly by the stitching device (160);

- clamping and transfer of the completed green tyre by a transfer ring (101 to 104) of the transfer device (91) to a place, where it can be removed.

12. A method for production of green tyres according to claim 10 or 11, characterized in that after having transferred the belt onto the tread building drum and before the tread building a narrow strip supplied from a serviser (210) is wound up on the belt in a spiralled manner by a winding device (170) for spiralling the narrow strip.